

**MARK SCHEME for the May/June 2011 question paper  
for the guidance of teachers**

**0580 MATHEMATICS**

**0580/12**

Paper 1 (Core), maximum raw mark 56

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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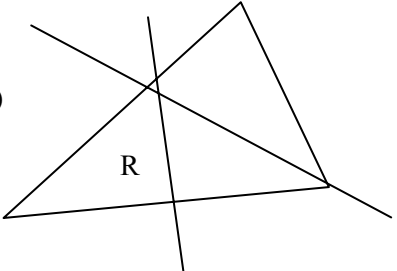
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### Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working

Qu.	Answers	Mark	Part Marks
1	64	1cao	
2	52	1	
3	(a) $\frac{3}{10}$ or 0.3 or 30%  (b) 0 or $\frac{0}{10}$ or 0%	1  1	
4	$58.25 \leq d < 58.35$	1,1	SC1 for both correct values but reversed
5	Working must be shown.	2	M1 $\frac{14}{9}$ and $\frac{16}{9}$ M1 $\frac{14}{16} = \frac{7}{8}$ oe or visible cancelling
6	$0.8^2$	2	M1 conversion of $\frac{16}{27}$ (= 0.5(9..)) and $0.8^2$ (= 0.64) to decimals seen
7	$5.51 \times 10^3$	2	B1 for $5.508 \times 10^3$ or figs 551 or $5.5 \times 10^3$
8	euros (with correct working) or (6)€	2	M1 one of $6 \times 1.9037$ or $11.5 \div 1.9037$ or $11.5 \div 6$ seen
9	$4x^{-24}$ or $\frac{4}{x^{24}}$	2	B1 $4x^n$ B1 $\frac{k}{x^{24}}$ or $kx^{-24}$ for any numerical $k, n$
10	14.4(.....)	3	M2 for $\sqrt{(17^2 - 9^2)}$ or M1 for $17^2 = x^2 + 9^2$ or better seen
11	(a) (0)700 or 7 am  (b) 1700 or 5 pm	2  1	M1 $100 - (5 \times \text{their}(22 - 6) + \text{their}(13 - 8))$ or better soi

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12	<p>(a) <math>\begin{pmatrix} -2 \\ 3 \end{pmatrix}</math></p> <p>(b) <math>\begin{pmatrix} 2 \\ -3 \end{pmatrix}</math></p>	<p>1,1</p> <p>1ft</p>	<p><b>B1</b> for 1 correct component. <b>SC1</b> for both correct but written as coordinates as the answer.</p> <p>ft their <b>(a)</b> with signs reversed. Not a strict follow through.</p>
13	<p>(a) <math>\frac{80}{20 - 4 \times 4}</math></p> <p>(b) 20</p> <p>(c) 14.0</p>	<p>1</p> <p>1</p> <p>2</p>	<p>Condone either 78 for 80 or 22 for 20 but not both.</p> <p><b>SC1</b> for answer 13 if clearly from <math>78 \div (22 - 4 \times 4)</math> or <math>78 \div (22 - 16)</math>.</p> <p><b>B1</b> for 13.9(9.....) or 14 in working or in the answer.</p>
14	<p>(a) (1, 2), 3, 6, 9, (18)</p> <p>(b) 2, 3</p> <p>(c) 54, 72, 90</p>	<p>2</p> <p>1</p> <p>1cao</p>	<p><b>B1</b> for 2 correct.</p>
15	<p>(a) <math>2x - 11y</math> final answer</p> <p>(b) <math>3x(2x - 3y)</math> final answer</p>	<p>2</p> <p>2</p>	<p><b>M1</b> for <math>6x - 15y</math> or <math>-4x + 4y</math> or better seen or <b>B1</b> for <math>2x \pm jy</math> or <math>kx - 11y</math>.</p> <p><b>B1</b> for <math>3(2x^2 - 3xy)</math> or <math>x(6x - 9y)</math> or <math>3x(2x - by)</math> or <math>3x(ax - 3y)</math> (<math>a, b \neq 0</math>)</p>
16	<p>(a) 17.5(.....)</p> <p>(b) 20.38 to 20.44</p>	<p>2</p> <p>2ft</p>	<p><b>M1</b> for <math>\sin 38 = \frac{x}{28.5}</math> or better</p> <p><b>M1</b> for <math>\tan (BCD =)</math> their <b>(a)</b> <math>\div 47.1</math></p>
17	<p>(a) Diameter</p> <p>(b) 27</p>	<p>1</p> <p>3</p>	<p><b>M1</b> for <math>(180 - 54) \div 2</math> <b>M1</b> ind for <math>90 -</math> their angle <math>OBD</math>.</p>
18	<p>(a) (i)</p> <p>(ii)</p> <p>(b)</p> 	<p>2</p> <p>2</p> <p>1</p>	<p><b>B1</b> correct line <b>B1</b> 2 sets of correct arcs</p> <p><b>B1</b> correct line <b>B1</b> two sets of correct arcs</p> <p>correct region, shaded or shown by the letter R</p>

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<b>19</b>	<b>(a) (i)</b> 8 (min)	<b>1</b>		
	<b>(ii)</b> 7.8 (km)	<b>1</b>		
	<b>(b) (i)</b> Ruled line from (0720, 0) to (0816, 9.4)	<b>1</b>		Ignore line continued above school.
	<b>(ii)</b> (0)738 to (0)740	<b>1ft</b>		Follow through their graph
	<b>(iii)</b> 5.8 (km) to 6.4 (km)	<b>1ft</b>		Follow through their graph.
	<b>(iv)</b> 17 to 19 (min)	<b>1ft</b>	Follow through their graph	